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Cervical cytology screening in sexually transmitted diseases clinics in the United Kingdom

BRITISH CO-OPERATIVE CLINICAL GROUP

SUMMARY During a three month prospective study in 116 sexually transmitted disease (STD) clinics throughout the United Kingdom, out of 17 261 women who underwent cervical cytology, 1167 had dysplastic smears and 115 had positive smears. Positive smears were more prevalent in women attending Welsh clinics than elsewhere in the United Kingdom and increased in incidence with rising patient age. Of all cytological abnormalities reported, 56% of dysplastic smears and 33% of positive smears were found in women aged under 25 years. A subsequent retrospective study in 10 teaching hospitals suggested that past or present genital warts were associated with these cytological abnormalities of the cervix, especially in younger women.

Introduction

Risk factors for the development of cervical carcinoma include low age at first coitus, large numbers of sexual partners, and a history of sexually transmitted diseases (STD). Epithelial abnormalities that may be precursors of frank malignancy can be detected by cervical cytology smears. To assess the incidence of these epithelial abnormalities in women attending STD clinics, the British Co-operative Clinical Group organised a survey of the results of cervical cytology screening in United Kingdom clinics during a prospective three month study period. In a follow up to this study, selected clinics provided details of past and present STD in patients who yielded abnormal smears during the prospective study.

Methods

PROSPECTIVE STUDY OF ABNORMAL CERVICAL CYTOLOGY

A questionnaire was circulated to individual clinics in the United Kingdom on which details of the following were requested: the clinic policy for cervical cytology screening; and the results of cervical cytology screening, according to the age of the patients, for a prospective three month study period from 1 October to 31 December 1982.

Cervical cytology screening policies were categorised as being: routine (all new patients were screened), semi-routine (all new patients were screened who had not been screened elsewhere within the preceding 12 months), selective (only selected patients were screened; the factors determining this selection were asked about), or none (no screening was performed).

The following definitions were used to classify abnormal smears: grade III (showing mild to moderate dyskaryosis or mild to moderate cellular atypia consistent with CIN I or CIN II), grade IV (showing severe dyskaryosis consistent with carcinoma in situ (CIN III) or individual cells suggestive of malignancy), or grade V (positive smear showing several malignant cells).

The results from individual clinics were collated. Differences between regions and between the age groups of patients were assessed.

RETROSPECTIVE STUDY OF CONCOMITANT STD IN WOMEN WITH ABNORMAL CYTOLOGY

Teaching hospitals that had participated in the prospective study were asked to review retrospectively the records of women with abnormal cytology for STD at the time smears were performed and for preceding or accompanying genital warts or genital herpes. The results from individual clinics were collated. The incidence of STD was compared between women with varying degrees of cytological abnormality and between women of different age groups. Participants in this follow up study were also requested to supply results of any cervical biopsy undergone by the women with abnormal cytology.

Results

PROSPECTIVE STUDY

Screening policy

Of 116 clinics that replied to the questionnaire, 54

Address for reprints: Dr G R Kinghorn, Department of Genitourinary Medicine, Royal Hallamshire Hospital, Glossop Road, Sheffield S10 2JF

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TABLE I *Cytological abnormalities found in 17 261 women screened in the United Kingdom during three months*

Region	No of clinics	No of women screened	No (%) with abnormalities of: Grade III	Grades IV or V	Total (%)
England:					
North	42	4 670	278 (6·0)	31 (0·7)	309 (6·6)
Midlands	17	3 013	253 (8·4)	27 (0·9)	280 (9·3)
South	23	2 189	146 (6·7)	12 (0·6)	158 (7·2)
London	20	5 858	295 (5·0)	22 (0·4)	317 (5·4)
Total	102	15 730	972 (6·2)	92 (0·6)	1 064 (6·8)
Scotland	5	640	38 (6·0)	3 (0·5)	41 (6·4)
N Ireland	3	271	7 (2·6)	3 (1·1)	10 (3·7)
Wales	6	620	150 (24·2)	17 (2·7)	167 (26·9)
All clinics	116	17 261	1 167 (6·8)	115 (0·7)	1 282 (7·4)

(47%) performed routine screening in all new patients, 23 (20%) performed routine screening in all new patients who had not had a smear taken elsewhere during the past 12 months, 35 (30%) performed selective screening, and four (3%) did not perform any screening. Selective screening was usually based on patient age (some clinics did not perform cervical cytology in teenagers), the presence of symptoms or signs indicative of cervical abnormality, or other factors (such as a history of genital herpes or genital warts).

Incidence of abnormal smears in various regions

Of the 17 261 women screened during the three month study period, 1282 (7·4%) had abnormal cytology results (grade III in 1167, and grades IV or V in 115; 435 of the women screened attended clinics that reported only grades IV and V abnormalities. Table I shows the regional variations in the numbers and percentages of women screened who had cytological abnormalities. There was no appreciable difference between the results from all the English compared with the Scottish clinics. The results reported from Welsh clinics, however, were much higher than from any other part of the United Kingdom.

Incidence of abnormal smears in different age groups

Table II shows the incidence of abnormal smears in women in different age groups. Of the 17 261 women screened 22% (3765) were aged 15–19, 36% (6155) were aged 20–24, 19% (3293) were aged 25–29, 11% (1938) were aged 30–34, 6% (1082) were aged 35–39, and 6% (1028) were 40 or older. There were no significant regional variations in the age distributions of screened women.

Grade III abnormalities were most common in women aged 20–34, and more common in women aged under 20 than in those aged 40 or more. The more severe abnormalities, grades IV and V, showed a trend towards increasing incidence with increasing age of patients. The incidence of any abnormality was greatest in women aged 25–29, but was higher in women aged under 20 than in those aged 40 or more.

Of all the women screened, those aged under 25 made up 56% (654 of 1167) of women with grade III abnormalities and 33% (38 of 115) of those with grades IV or V abnormalities.

RETROSPECTIVE STUDY

Number of participants

Ten teaching hospitals provided data about the prevalence of concomitant genital tract infections in women found to have cytological abnormalities during the prospective study period. Of these clinics, eight were in England and one each were in Scotland and Northern Ireland.

Incidence of concomitant genital tract infections

Table III gives details of concomitant infections in 234

TABLE II *Incidence of abnormal smears in 17 261 women analysed by age groups*

Age (years)	No of women screened	No (%) with abnormal smears of: Grade III	Grades IV or V	Total
15-19	3 765	225 (59·8)	6 (1·6)	231 (61·4)
20-24	6 155	458 (74·4)	32 (5·2)	490 (79·6)
25-29	3 293	250 (75·9)	34 (10·3)	284 (86·2)
30-34	1 938	148 (76·4)	13 (6·6)	161 (83·1)
35-39	1 082	72 (66·5)	16 (14·8)	88 (81·3)
40-44	512	26 (50·8)	7 (13·7)	33 (64·5)
45 and over	516	18 (34·9)	7 (13·6)	25 (48·4)
Total	17 261	1198 (69·4)	115 (6·7)	1313 (76·1)

TABLE III *Concomitant genital tract infections* in 263 women with abnormal cervical smears*

	No (%) with abnormal smears of:		
	Grade III (n=234)	*Grades IV or V (n=29)*	*Total (n=263)*
Gonorrhoea	29 (12)	3 (10)	32 (12)
Non-specific genital infection	38 (16)	7 (24)	45 (17)
Trichomoniasis	23 (10)	3 (10)	26 (10)
Candidiasis	51 (22)	3 (10)	54 (21)
Anaerobic vaginosis or infection with *Gardnerella vaginalis*	38 (16)	3 (10)	41 (16)
Genital warts	54 (23)	7 (24)	61 (23)
Genital herpes	17 (7)	2 (7)	19 (7)
Other sexually transmitted disease	12 (5)	3 (10)	15 (6)
None of above	57 (24)	3 (10)	60 (23)

*Some women had more than one infection.

women with grade III abnormalities and 29 women with grades IV or V abnormalities. Concomitant infections were present in 203 (77%) of the 263 women. They were found in 177 (76%) of the 234 women with grade III abnormalities and 26 (90%) of the 29 women with grades IV or V abnormalities. The incidence of diagnoses of infection in women with milder cytological abnormalities was similar to that in those with more severe abnormalities. With the exception of genital warts, the incidence of each infection was similar to its prevalence in all women who attend STD clinics. Past or present genital warts, however, were found in 23% (61/263) of all women with abnormal smears, which is more than double their prevalence in all female STD clinic attenders.

Table IV compares genital tract infections in women aged under 25 with those aged 25 or more. The differences in incidence of the common causes of cervicitis or vaginitis between the two age groups were not significant. Genital warts, however, were associated with abnormal smears in 42 (30%) of 138 younger women compared with 19 (15%) of 125 older women ($p<0.01$).

TABLE IV *Concomitant genital tract infections in 263 women with abnormal cervical cytology analysed by age*

	No (%) aged:	
	Under 25 (n=138)	*25 or more (n=125)*
Gonorrhoea	21 (15)	11 (9)
Non-specific genital infection	28 (20)	17 (14)
Trichomoniasis	15 (11)	11 (9)
Candidiasis	27 (20)	27 (22)
Anaerobic vaginosis or infection with *Gardnerella vaginalis*	13 (9)	23 (18)
Genital warts	42 (30)	19 (15)*
Genital herpes	13 (9)	6 (5)
Other sexually transmitted disease	5 (4)	10 (8)
None of above	26 (19)	34 (27)

*$p<0.01$

Histological findings

Table V compares the results of cervical biopsy undertaken in 61 of the women with abnormal smears. Of the 44 women with milder cytological abnormalities, cervical intraepithelial neoplasia (CIN) grades I or II were reported in 36 (62%) women and CIN III in three (7%). Of the 17 women with more severe cytological abnormalities, six (35%) had CIN I or II and nine (53%) had CIN III. There were no cases of invasive carcinoma in women with grade III smears and one in a woman with a smear showing more severe abnormality.

TABLE V *Biopsy findings in 61 women according to severity of their abnormal smears*

	No (%) with abnormalities of:		
Biopsy findings	*Grade III (n=44)*	*Grades IV or V (n=17)*	*Total (n=61)*
Inflammatory changes only	5 (11)	1 (6)	6 (10)
CIN I & II	36 (82)	6 (35)	42 (68)
CIN III	3 (7)	9 (53)	12 (20)
Invasive carcinoma		1 (6)	1 (2)

CIN = Cervical intraepithelial neoplasia.

Table VI compares the biopsy results in the 61 women with abnormal smears, 24 of whom were aged under 25 and 37 were 25 or older. In the younger women CIN I or II was found in 21 (79%) and CIN III

in five (21%). In older women 23 (62%) had CIN I or II and seven (19%) had CIN III. The sole report of invasive carcinoma on biopsy was reported from a woman in the older age group.

TABLE VI *Biopsy findings in 61 women according to their ages*

	No (%) aged:	
Biopsy findings	*Under 25 (n=24)*	*25 or more (n=37)*
Inflammatory changes only		6 (16)
CIN I and II	19 (79)	23 (62)
CIN III	5 (21)	7 (19)
Invasive carcinoma		1 (3)

CIN = Cervical intraepithelial neoplasia.

Discussion

The DHSS committee on gynaecological cytology classifies a positive smear as one showing evidence of "severe dysplasia/carcinoma-in-situ" or "carcinoma-in-situ/? invasive carcinoma". This definition equates to smears classified as showing grades IV or V abnormalities as defined in this study. There are no comparable national statistics that relate to the number of positive smears per 1000 women screened. Available data merely refer to the proportion of smears examined that are positive, and not to the proportion of women screened. Thus national statistics are likely to overestimate the true prevalence of positive smears, as they fail to take account of women who have positive smears repeated and reported twice or more.

The age distribution of women screened in national statistics also differs from that in this study. In England and Wales 55% of all smears are performed in women under the age of 35 compared with 88% in the prospective study.

Most STD clinics perform cervical cytology screening yearly on a non-selective basis. During the three month prospective study 1282 (7·4%) of 17 261 women screened had abnormal smears, of whom 115 (6·6 per 1000 women screened) had positive smears. This compares with a national estimate of smears from all sources in all age groups of 6·8 positive cases per 1000 smears examined.[1] Table I shows that in our prospective study regional variations in the incidence of positive smears were pronounced. In England there was a lower prevalence of positive smears in women attending STD clinics in the south and in London than in women attending clinics elsewhere. The prevalence of "positive" smears was significantly increased in women attending STD clinics in Wales (26·7) per 1000 women screened) than elsewhere in the United Kingdom.

The detection rate of positive smears also varied with the age of patients. The ratio of mild (grade III) to severe (grades IV or V) abnormalities reported decreased with increasing patient age. The incidence of positive smears per 1000 women screened for women aged under 25 years, 25-29, 30-34, or 35 or more were 3·8 10·3, 6·8, and 14·2 respectively. The national statistics for the incidence of positive smears per 1000 smears examined in the corresponding age groups are 3·0, 8·6, 11·4, and 6·8. As these statistics are likely to include an overestimate of the numbers of positive patients as opposed to positive smears in each age group, these results suggest that younger as well as older women attending STD clinics are at increased risk of having positive smears.

The retrospective study provided data on concomitant genital tract infections and on histological reports on some of the women found to have abnormal cervical cytology during the prospective study. The incidence of concomitant infections in these women was high, and the results suggested an association of genital warts with both dysplastic and positive smears, especially in women aged under 25 years. The results did not suggest any similar association between abnormal cytology and past or present genital herpes or with other concurrent cervical or vaginal infections. The inflammatory changes that occur with cervical and vaginal infections may mask other cytological abnormalities, and the appropriate timing of performing cervical cytology smears in women attending STD clinics needs further consideration.

The small number of biopsy results were insufficient for us to draw firm conclusions about the true prevalence of CIN in women of different age groups attending STD clinics. Nevertheless, it was found that 7% of grade III smear abnormalities were false negatives as their biopsy results showed evidence of CIN III. Conversely, 40% of women with "positive" smears were found to have less histological abnormality than was suggested cytologically.

Reference

1. Roberts A. Cervical cytology in England and Wales 1965-80. *Health Trends* 1982;14:41-3.